

REMARKS

Applicants thank the Examiner for the very thorough consideration given the present application. Claims 1-4 and 11-12 are currently pending in the present application. No new matter has been added by way of the present amendment. For instance, the amendment to claim 1 is supported by the Specification at, for example, page 11 to page 13 (particularly, page 13, lines 5-13), as well as the Examples. New claims 11 and 12 are supported by page 15, lines 11-12 of the Specification. Accordingly, no new matter has been added.

In view of the amendment and remarks herein, Applicants respectfully request that the Examiner withdraw all outstanding rejections and allow the currently pending claims.

Substance of Interview

Applicants thank the Examiner for the time, helpfulness and courtesies extended to Applicants' representatives during the Interview of December 8, 2009. The assistance of the Examiner in advancing prosecution of the present application is greatly appreciated. In compliance with M.P.E.P. § 713.04, Applicants submit the following remarks.

The Interview Summary form issued on December 16, 2009 summarizes the discussions at the Interview. The outstanding rejection of the claims was discussed. Applicants reaffirmed their previous position that the prior art of record fails to teach or suggest every aspect of the present invention. Various ways of addressing the prior art rejection were discussed.

Issues Under 35 U.S.C. 102(b)

Claims 1-4 stand rejected under 35 U.S.C. 102(b) as anticipated by Seo et al. (U.S. 2002/0086180) (hereinafter "Seo"). Applicants respectfully traverse.

The Examiner asserts that Seo discloses an organic electroluminescent device comprising a pair of electrodes, a light emitting layer, a hole transport layer and an electron transport layer. The Examiner further asserts that Seo teaches a light emitting layer comprising two host materials, a hole transporting material and an electron transporting and hole blocking material.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of anticipation. For anticipation under 35 U.S.C. §102, the reference must teach each and every aspect of the claimed invention either explicitly or impliedly. Any feature not directly taught must be inherently present. The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993). To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present". *In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949 (Fed. Cir. 1999). The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *Id.*

Seo discloses an electroluminescent device comprising two light emitting regions. However, Seo fails to explicitly or implicitly teach at least the following claimed limitations:

(i) A light emitting material comprising a red phosphorescent material, wherein the red phosphorescent material has a maximum emission wavelength of 550 to 700 nm; and

(ii) A light emitting layer which contacts the hole transport layer, wherein a hole transporting material in the hole transport layer has a smaller ionization potential than the two host materials in the light emitting layer.

As to (i) above, Applicants note that the EL devices in Embodiments 11 and 12 of Seo are "green phosphorescent" devices (e.g., Ir(ppy)₃ is used). In contrast, the present EL device is a "red phosphorescent" device, due to the use of a red phosphorescent material having a maximum emission wavelength of 550 nm to 700 nm.

As to (ii) above, Applicants note that, although the hole transporting material (NPD) in the hole transport layer (1003) of Seo may have a smaller ionization potential than the two host materials (CBP and BCP) in the second region (1005), the second region (1005) does not contact the hole transport layer (1003) (see, e.g., Embodiment 11 of Seo). In contrast, the present claims require that the light emitting layer contact the hole transport layer.

The Examiner's attention is respectfully directed to page 13, lines 5 to 13 of the present Specification, where it is disclosed that one of the novel features of the present invention is the presence of at least two host materials in the light emitting layer, wherein a hole transporting material in the hole transport layer has a smaller ionization potential (IP) than any of the host materials in the light emitting layer, in order to provide an energy difference **at the interface between the layers** (e.g., where the layers contact each other). The hole injection properties are thus controlled by taking advantage of that energy difference to adjust the region of radical cation generation.

Evidently, Seo fails to explicitly or implicitly teach each and every limitation of the present invention and thus fails to anticipate the same. Moreover, Applicants submit that the present invention would not have been obvious based on the teachings of Seo.

At paragraph [0016], Seo describes the background art and discloses that “being a junction between substances of different kinds...the laminated structure described above will necessarily produce an energy barrier at an interface the substances. Since the presence of an energy barrier inhibits movements of a carrier at the interface, the two following problems are caused...” Thus, in view of the problems caused when an energy barrier is produced at the interface of the substances, Seo’s invention aims to mitigate the presence of such an energy barrier in an organic compound layer (see paragraph [0025]). These descriptions in Seo teach away from the present invention.

Moreover, Applicants note that the present invention achieves superior and unexpected results over the prior art of record. In order to mitigate the undesirable energy barrier, Embodiment 11 in Seo uses a common material (NPD) as both the hole transporting material and the light emitting material (e.g., the hole transporting material (NPD) in the hole transport layer (1003) has the same ionization potential as the host material (NPD) in the light emitting layer (first region 1004) contacting the hole transport layer (1003)). In contrast, the present invention employs NPD as a hole transporting material in the hole transport layer, and further employs two host materials in the light emitting layer contacting the hole transport layer, which host materials are different from NPD and have larger ionization potentials than NPD (see Examples).

As evidenced by the enclosed Declaration under 37 C.F.R. 1.132, due to the claimed configuration, an energy difference is formed between the hole transport layer and the light

emitting layer in the present device, and a significant improvement in external quantum efficiency is obtained. Moreover, the claimed device is better suited for industrial production, since it doesn't involve complicated operations for vacuum deposition (see also pages 1, 2 and 59 of the Specification).

In view of the above, reconsideration and withdrawal of this rejection are respectfully requested.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and objections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Vanessa Perez-Ramos, Reg. No. 61,158, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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Enclosure: Declaration Under 37 CFR 1.132